Look at the frequency tables.
How could you represent the data?

How would the representations look for each frequency table?

1

kids	freq
0	1
1	3
2	7
3	3
4	1

2

kids	freq
0	3
1	3
2	3
3	3
4	3

3

kids	freq
0	5
1	3
2	3
3	2
4	2

4

kids	freq
0	1
1	2
2	3
3	4
4	5

5

kids	freq
0	5
1	2
2	1
3	2
4	5

which chart goes with which data set?

1

kids	freq
0	1
1	3
2	7
3	3
4	1

2

kids	freq
0	3
1	3
2	3
3	3
4	3

3

kids	freq
0	5
1	3
2	3
3	2
4	2

4

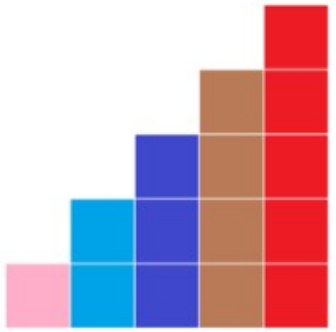
kids	freq
0	1
1	2
2	3
3	4
4	5

5

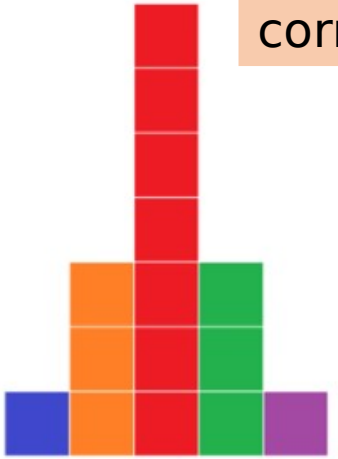
kids	freq
0	5
1	2
2	1
3	2
4	5

These bar charts are actually not very mathematically correct….does anyone know why?

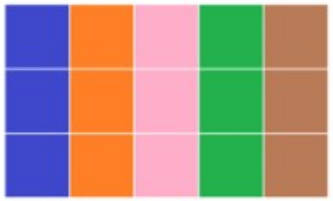
a



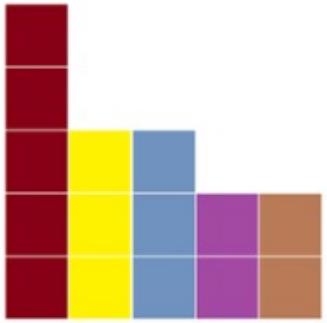
b



c



d



e

9/11/20

Discrete Data

I want to do a survey to gain information on lots of things. What would the difference be in the types of answers gained from these questions...
What kind of chart could you use to represent each one?

Favourite film

Heigh t

School year

Shoe size

Number of siblings

Hand span

Next holiday destination

Key terminology when describing data:

- Qualitative vs Quantitative

Qualitative data is non numerical and quantitative is numerical data.

- Continuous vs Discrete

Continuous data can take any value, it is measured whereas discrete data can only take certain values, there are a countable number of possible values.

- Categorical

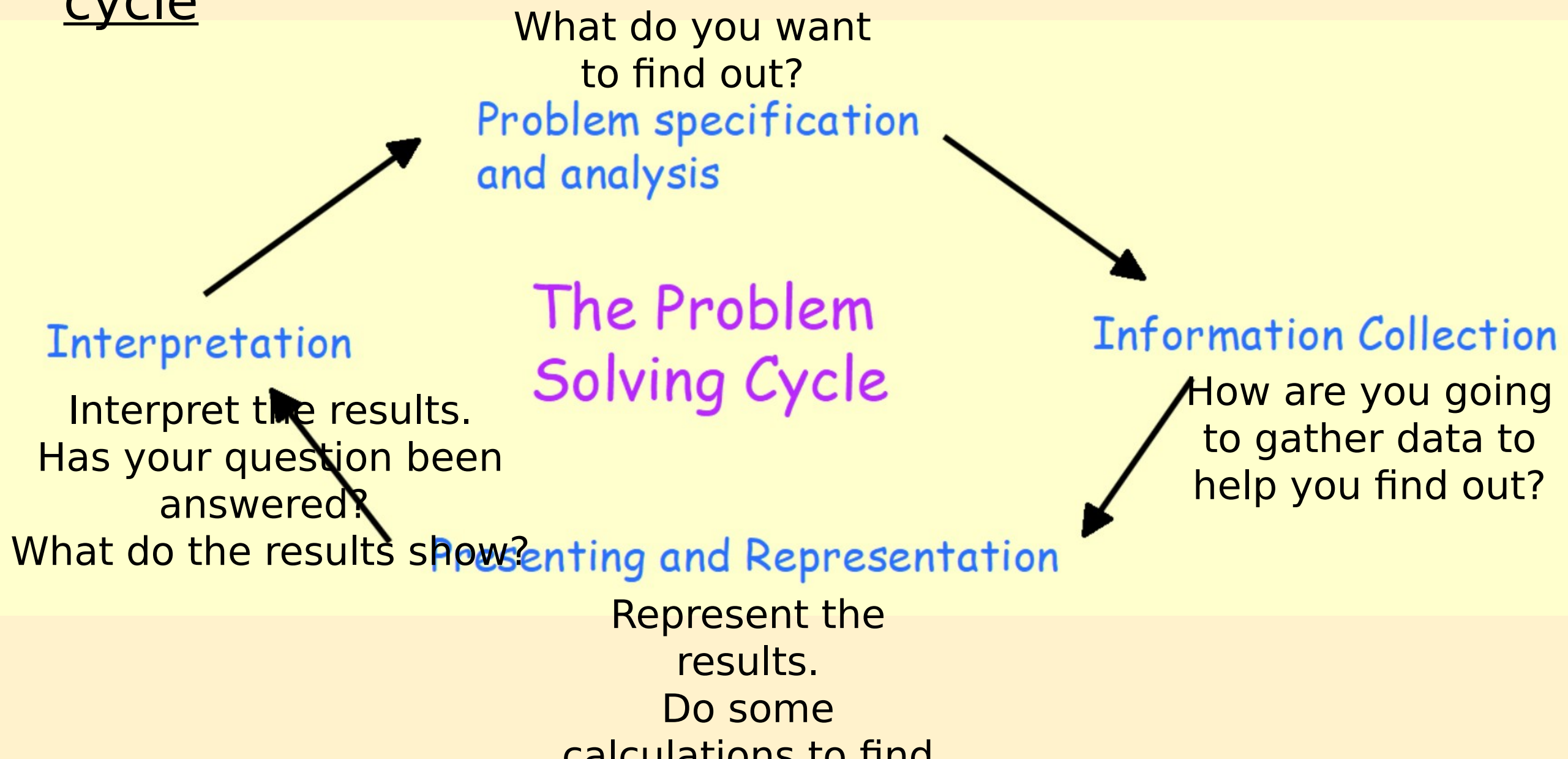
When data is collected in to groups or categories.

- Raw

Raw data is collected from a source and nothing has been done to it.

https://www.mathspad.co.uk/interactives/typesOfData/typesOfData.php

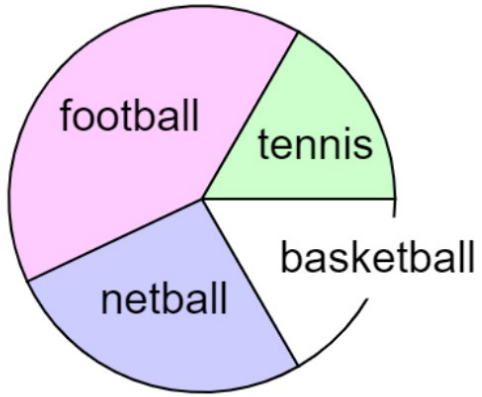
Statistics – The cycle



This week: Discrete data

- Calculating and interpreting with discrete data (today!)
- Representing discrete data

The pie chart shows some people's favourite sports.
What is the **mode**?



Mode = most common
Football

The salaries of some workers at a company are listed.
Work out the **median**.

£16,000
£16,000
£24,000
£27,000
£31,000
£106,000

Median: Put the values in order of size and find the middle

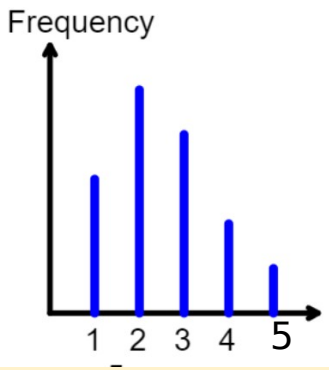
Middle of £24,000and £27,000:

. Some oranges on a set of scales are shown.
Work out the **mean**.

Mean: Add all the values together and divide by how many values there are

=

A bar-line graph showing the number of children in some families.
Work out the **range.**



Range = biggest value – smallest

Biggest number of children = 5

Smallest number of children = 1

Answer the questions about the frequency table showing how many bars of chocolate people eat in a week...

Bars	**Frequency**	Total
0	7	0
1	2	2
2	8	16
3	2	6
4	6	24
5	1	5
6	0	0

Total people = 26

Total bars = 53

How many people ate 1 bar of chocolate? 2

How many people ate 3 or 4 bars of chocolate? 8

What is the largest number of bars eaten in 1 week? 5

What is the range of the number of bars? 5 - 0 = 5

What is the most common number of bars eaten? 2 bars (frequency of 8)

How many bars were eaten altogether? Total bars = 53

How many people were asked? Total people = 26

What is the mean number of bars eaten? Mean number of bars = =

Find the mean number of goals scored in 10 games...

Goals in a game	Frequency
0	0
1	2
2	4
3	1
4	3

$Total\ games = 10$

Total

$0 \times 0 = 0$

$1 \times 2 = 2$

$2 \times 4 = 8$

$3 \times 1 = 3$

$4 \times 3 = 12$

$Total\ goals = 25$

Think, to find the mean number of goals. What sum do we need to do?

$$\frac{total\ goals}{total\ games}$$

Total goals $= 25$

Total games $= 10$

$$\text{Mean} = \frac{25}{10} = 2.5$$

On average, 2.5 goals are scored per game

Worked Example

Calculate the mean number of siblings

Number of siblings	Frequency	total
0	2	0
1	3	3
2	1	2
3	2	6
4	2	8

Total = 10

Total = 19

1. Find the total number of siblings:
The sum of (number of siblings x frequency)

Total siblings = 19

2. Find the total number of people asked:
The sum of the frequency column

Total asked = 10

3. Mean =

Mean = 1.9

Your Turn

Calculate the mean number of siblings

Number of siblings	Frequency	total
0	4	0
1	6	6
2	2	4
3	4	12
4	4	16

Total = 20

Total = 38

Total siblings = 38

Total asked = 20

Mean =

1. Find the mean number of siblings:

Siblings	Frequency
0	10
1	7
2	6
3	2
4	5

You have a go...

Total siblings =

Total people asked =

Mean =

2. Find the mean number pies eaten per month:

Pies eaten in 1 month	Frequency
0	10
1	5
2	2
3	1
4	10

Total pies =

Total people asked =

Mean =

3. Find the averages and range for this table showing the number of goals scored in hockey matches:

Goals per game	Frequency
0	11
1	5
2	1
3	1
4	2

Mean =

ANSWERS

1. Find the mean number of siblings:

Siblings	Frequency
0	10
1	7
2	6
3	2
4	5

Total siblings = 45

Total people asked = 30

Mean = 1.5

2. Find the mean number pies eaten per month:

Pies eaten in 1 month	Frequency
0	10
1	5
2	2
3	1
4	10

Total pies = 52

Total people asked = 28

Mean = 1.86 (3 sf)

3. Find the mean for this table showing the number of goals scored in hockey matches:

Goals per game	Frequency
0	11
1	5
2	1
3	1
4	2

Mean = 0.9

Finding the mode, median and range

What is special about the range??

Together

Number of siblings	Frequency
0	2
1	4
2	1
3	2
4	2

6th person lies in this group

Mode = most common number of siblings (with the highest frequency) — Mode = 1 sibling

Range = biggest number of siblings – smallest number of siblings — Range = 4 – 0 = 4

Median = how many siblings the middle person has.
Middle person = — Middle person =

Median = 1 sibling

Your turn

Number of siblings	Frequency
0	4
1	7
2	2
3	4
4	4

11th person lies in this group

Mode = most common number of siblings (with the highest frequency) — Mode = 1 sibling

Range = biggest number of siblings – smallest number of siblings — Range = 4 – 0 = 4

Median = how many siblings the middle person has.
Middle person = — Middle person =

Median = 1 sibling

1. Find the mode, median and range

Siblings	Frequency
0	10
1	7
2	6
3	2
4	5

You have a go…

Mode =

Range =

Median =

2. Find the mode, median and range

Pies eaten in 1 month	Frequency
0	10
1	5
2	2
3	1
4	10

Mode =

Range =

Median =

3. Find the averages and range for this table showing the number of goals scored in hockey matches:

Goals per game	Frequency
0	11
1	5
2	1
3	1
4	2

Mode =

Range =

Median =

ANSWERS

1. Find the mode, median and range

Siblings	Frequency
0	10
1	7
2	6
3	2
4	5

Mode = 0 siblings

Range = 4 – 0 = 4

Median = 1 sibling
30 people altogether.
15.5th person has 1 sibling

2. Find the mode, median and range

Pies eaten in 1 month	Frequency
0	10
1	5
2	2
3	1
4	10

Mode = 0 and 4 pies

Range = 4 – 0 = 4

Median = 1 pie
28 people altogether.
14.5th = 1 pie

3. Find the averages and range for this table showing the number of goals scored in hockey matches:

Goals per game	Frequency
0	11
1	5
2	1
3	1
4	2

Mode = 0 goals

Range = 4 – 0 = 4

Median? 0 goals
There are 20 games played altogether, middle game = 10.5th , so there were 0 goals scored here

Challenge!

Class A scores: 9 6 6 6 10 2 10 3

Class B scores: 3 9 3 6 10 3 9 10

Make 2 comparisons about the classes.

Who do you think is the best class? Why?

Why might some people disagree with your answer?

Class A

Mode = 6
Median = 6
Mean = 6.5
Range = 8

Class B

Mode = 3
Median = 7.5
Mean = 6.625
Range = 7

Which average was perhaps not the best to use??

Extension

- Solving simultaneous equations needed to answer the following questions...

The table shows the number of days that 30 pupils were absent in a term.

Days absent, x	0	1	2	3	4	5
Frequency, f	14	a	3	b	1	2

Given that the mean number of days absent was 1.4, work out the values of ***a*** and ***b***.

Hint: Can you form 2 equations from the information given?

$$14+a+3+b+1+2=30$$

$$20+a+b=30$$

$$a+b=10$$

$$\frac{0+a+6+3b+4+10}{30}=1.4$$

$$0+a+6+3b+4+10=42$$

$$a+3b+20=42$$

$$a+3b=22$$

$$a+b=10$$

$$a+3b=22$$

$$2b=12$$

$$b=6$$

$$a=4$$

The table shows the number of days that 30 pupils were absent in a term.

Days absent, x	0	1	2	3	4	5
Frequency, f	14	a	3	b	1	2

Given that the mean number of days absent was 1.4, work out the values of ***a*** and ***b***.

Hint: Can you form 2 equations from the information given?

$14 + a + 3 + b + 1 + 2 = 30$

$20 + a + b = 30$

$a + b = 10$

$$\frac{0 + a + 6 + 3b + 4 + 10}{30} = 1.4$$

$0 + a + 6 + 3b + 4 + 10 = 42$

$a + 3b + 20 = 42$

$a + 3b = 22$

$a + b = 10$

$a + 3b = 22$

$2b = 12$

$b = 6$

$a = 4$

2. This table shows how many mobile phones are confiscated from classes:

Mobiles Confiscated	**Number of classes**
0	11
1	a
2	*3*
3	*1*

The mean number of mobiles confiscated from a class is 0.7. What is the missing value in the table?

1. This table shows how many calls 100 people receive in a day. Given that the mean number of calls is 2.41. Find the values of and

Calls	**0**	**1**	**2**	**3**	**4**	**5**
Frequency	20			12		18

1. This table shows how many calls 100 people receive in a day. Given that the mean number of calls is 2.41. Find the values of and

Calls	0	1	2	3	4	5
Frequency	20			12		18

$$20+a+20+12+b+18=100$$

$$70+a+b=100$$

$$a+b=30$$

$$\frac{0+a+40+36+4b+90}{100}=2.41$$

$$0+a+40+36+4b+90=241$$

$$166+a+4b=241$$

$$a+4b=75$$

$$a+b=30$$

$$a+4b=75$$

$$3b=45$$

$$b=15$$

$$a=15$$

2. This table shows how many mobile phones are confiscated from classes:

Mobiles Confiscated	**Number of classes**
0	11
1	a
2	*3*
3	*1*

The mean number of mobiles confiscated from a class is 0.7. What is the missing value in the table?

$$11+a+3+1=n \quad 15=n-(0.7n-9)$$
$$15=n-a \quad 15=0.3n+9$$
$$\frac{0+a+6+3}{n}=0.7 \quad 15=0.3n+9$$
$$6=0.3n$$
$$9+a=0.7n \quad n=20$$
$$a=0.7n-9 \quad a=5$$